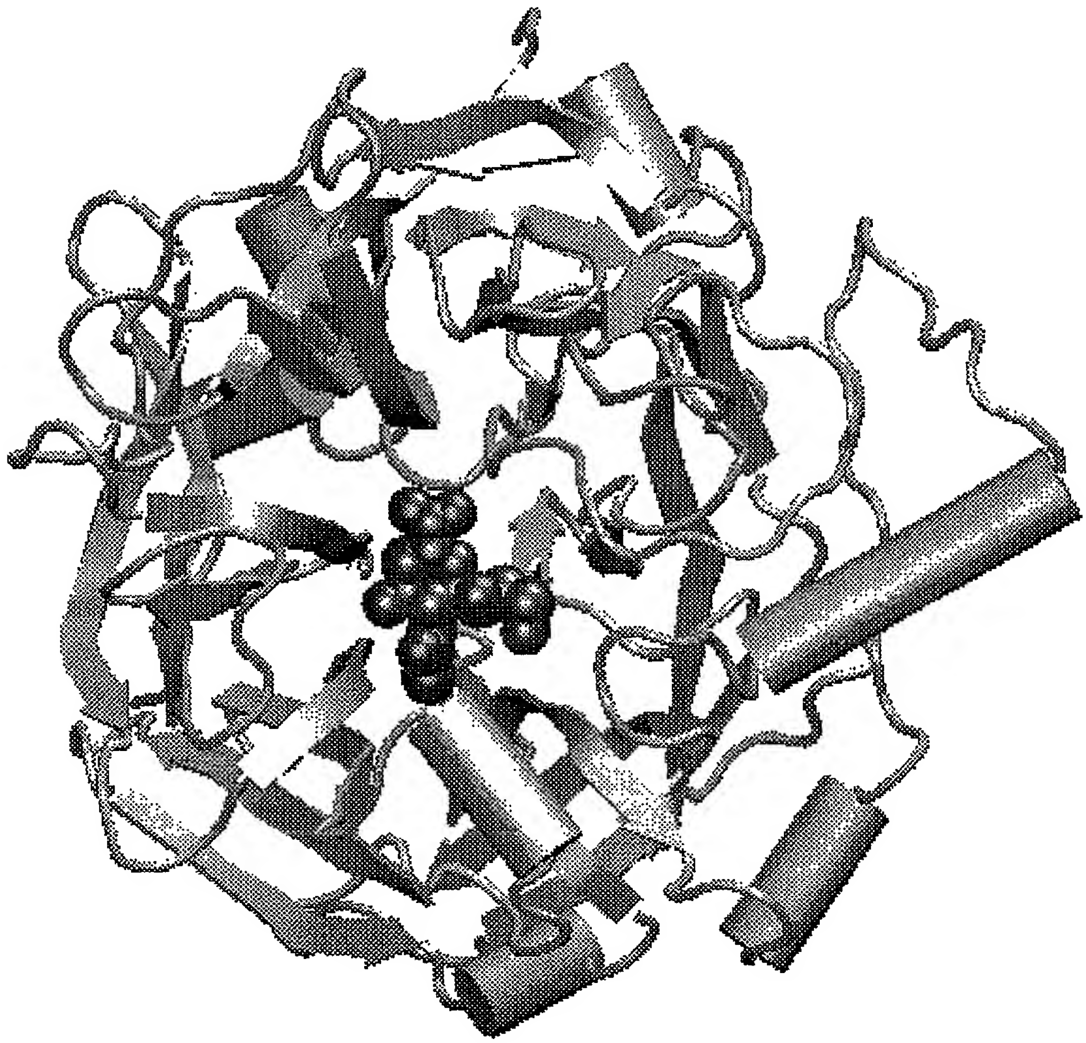

Fig. 1

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Sendai        TIAVHHAEG APLEPHSFWRCPVGEPYLSSDPKISLLLGPSLLSGS TIS  V L  LSIGEAIYA SS L TQG A IGK Y VLQL YISLNSDMFP
PIV1          TIAIHHADG SPLDPHDFWRCPVGEPLLSNNPNISLLPGPSLLSGS TIS  V L  LSIGDAIYA SS L TQG A IGK Y VLQL YISLNSDMYP
PIV3          RIT..HDVG KPLNPDDFWRCTSGLPSLMKTPKIRLMPGPGLLAMP TVD  V T  LVINDLIYA TS L TRG Q IGK Y VLQI IITVNSDLVP
SV5           AALINDNRY NGINQFYFSIAEGRNLTL..GP...LLNMPSFIPTA TPE  T I  FSLTKTHWC TH V LNG Q HVS N FVSM IIEPTSAGFP
PIV2          NLLLHDAAY NGLNKFLVLKSYNGTPKY..GP...LLNIPSFIPSA SPN  T I  FSLIKTHWC TH V LGD L FTT N YLAM IIQQSAAAFP
Mumps         IPLVNDLRF NGINKFIIEDYATHDFSI..GH...PLNMPSFIPTA SPN  T I  FSLGKTHWC TH V NAN K HTS N YISM ILVQTASGYP
NDV    (124)  GAPIHDPDF GGIGKELIVDNASDVTSFYPSA...FQEHLNFIPAP TGS  T I  FDMSATHYC TH V LSG R HSH H YLAL VLRTTATGRI
                         β5S0     β6S4                          β1S1     β1S2                  β1S3

Sendai        DLNPVVSHTYDIND         VVATGTRGYQL SMPTVD RT  SSDGIEDLVLDVLDLKGSTKSHRYRNSEVDLDHPFSALY SV N IATEGSLI LG
PIV1          DLKPVISHTYDIND         VIAAGTRGYQL SLPTVN TT  SSEGIEDLVFDILDLKGKTKSHRCKNEDITFDHPFSAMY SV S IKIENTLI LG
PIV3          DLNPRISHTFNIND         LALLNTDVYQL STPKVD RS  ASSGIEDIVLDIVNHDGSISTTRFKNNNISFDQPYAALY SV P IYYKGKII LG
SV5           FFRTLKTLYLSDGV         ISTVPGGCMMY FVSTQP RD  FSAAPPEQRIIIMYYNDTIVERII..NPPGVLDVWATLN GT S VYYLGWVL PI
PIV2          IFRTMKTIYLSDGI         VTAIPGGCVLY YVATRS KE  ATTDLAELRLAFYYYNDTFIERVI..SLPNTTGQWATIN AV S IYHLGFIL PV
Mumps         MFKTLKIQYLSDGL         IATVPDGCAMY YVSTQL TD  AGSSPPTQKLTLLFYNDTVTERTI..SPTGLEGNWATLV GV S IYFENKLI PA
NDV    (220)  FFSTLRSISLDDTQ         VSATPLGCDML SKVTET EE  NSAVPTLMAHGRLGFDGQYHEKDL..DVTTLFEDWVANY GV G SFIDGRVW SV
                β1S4         β2S1       β2S2      α1         β2S3    β2S4   α2    β3S1a     β3S1b β3S2

Sendai          LTTPLQGDTKCRT.........QG QQVSQDTCNE LKI...TWLGGKQVVNVIIRVNDYLSERPKIRVTTIPITQNYL A   LLKLGDRVYI T
PIV1            LTTPLQGDTKCVT.........NR ANVNQSVCND LKI...TWLKKRQVVNVLIRINNYLSDRPKIVVETIPITQNYL A   LLKLGKKIYI T
PIV3            LEHPINENAICNT.........TG PGKTQRDCNQ SHS...PWFSDRRMVNSIIVVDKGLNSIPKLKVWTISMRQNYW S   LLLLGNKIYI T
SV5             VIKGTSLWNNQANKYFIPQMVAAL SQNQATQVQN KSSYYSSWFGNRMIQSGILACPLRQDLTNECLVLPFSNDQVLM A   LYMYGDSVYY Q
PIV2            LIKGTPSYNKQSSRYFIPKHPNIT AGKSSEQAAA RSSYVIRYHSNRLLQSAVLICPLSDMHTARCNLVMFNNSQVMM A   LYVIDNNLYY Q
Mumps           VLPNSSLGVKSAREFFRPVNPYNP SGPQQDLDQR LRSYFPSYFSNRRVQSAFLVCAWNQILVTNCELVVPSNNQTLM A   VLLINNRLLY Q
NDV    (317)    LKPNSPSDTVQEGKYVIYKRYNDT PDEQDYQIRM KSSYKPGRFGGKRIQQAILSIKVSTSLGEDPVLTVPPNTVTLM A   ILTVGTSHFL Q
                β3S2    α3                     α4            β3S3       β3S4                 β4S1     β4S2

Sendai         SSGWHSQLQIGVLDV....SH..PLTINWTPHEALS  NKE NWYNT KE IS  T AYP SPDAAN..........VATVT YANTS V TIM
PIV1           SSGWHSHLQIGSLDI....NN..PMTIKWAPHEVLS  NQD NWYNR RE IS  T AYP SPDAVN..........VATTT YANTS V TIM
PIV3           STSWHSKLQLGIIDI....TDYSDIRIKWTWHNVLS  NNE PWGHS DG IT  T AYP NPTGSI..........VSSVI DSQKT V VIT
SV5            SNSWWPMTMLYKVTITFTNGQPSAISAQNVPTQQVP  TGD SATNR GF LT  A AWL TNPSSTS..TFGSEATFTGSY NTATQ I TMY
PIV2           SSSWWSASLFYRINTDFSKGIPPIIEAQWVPSYQVP  VMP NATSF AN IT  A VWP NDPEPTSQNALNPNYRFAGAF RNESN T TFY
Mumps          STSWWPYELLYEISFTFTNSGQSSVNMSWIPIYSFT  SGN SGENV TA VS  L PWP TPYSHQS..GINRNFYFTGAL NSSTT V TLY
NDV    (416)   GSSYFSPALLYPMTV....SNKTATLHSPYTFNAFT  SIP QASAR NS VT  T PYP IFYRNHTLRGV......FGTM DSEQA L ASA
                        β4S3           β4S4                      β5S1             β5S2                β5S3

Sendai        YSNTTNIINMLRIKDVQLEVA TTISS ITHFGKG..  FH I INQKSLNTLQPMLFKTSIPKLCKAES
PIV1          YSNTSEIINMLRLKNVQLEAA TTTS. ITHFGKG..  FH V INQTSLNTLQPMLFKTSIPKICKITS
PIV3          YSTATERVNELAIRNKTLSAG TTTS. ITHYNKG..  FH V INHKSLDTFQPMLFKTEIPKSCS
SV5           IANNTQIISSQQFGSSGQEAA GHTT. FRDTGSVMV  IY I LSSSLLGQFQIVPFIRQVTLS
PIV2          TASASALLNTTGFNNTNHKAA TSST. FKNTGTQKI  LI I MGSSLLGEFQIIPFLRELIP
Mumps         VSALNNLKVLAPYGNQGLFAS TTTT. FQDTGDASV  VY M LASNIVGEFQILPVLTRLTIT
NDV    (505)  VFDSTSRSRITRVSSSSTKAA TTST. FKVVKTNKT  LS A ISNTLFGEFRIVPLLVEILKNDGVREARSG
              β5S3     β5S4       β6S1           β6S2            β6S3
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Figure 2

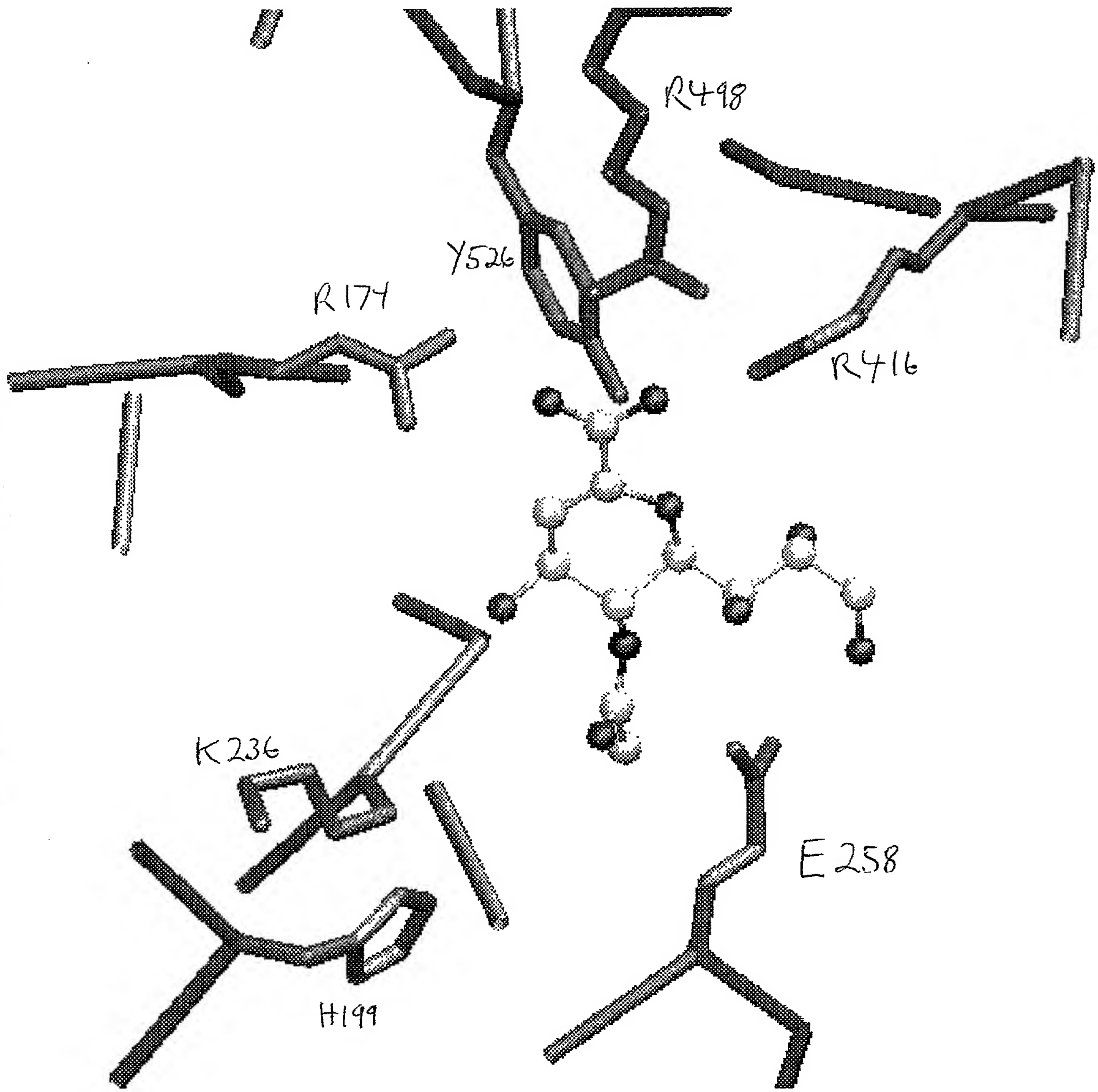

Fig. 3

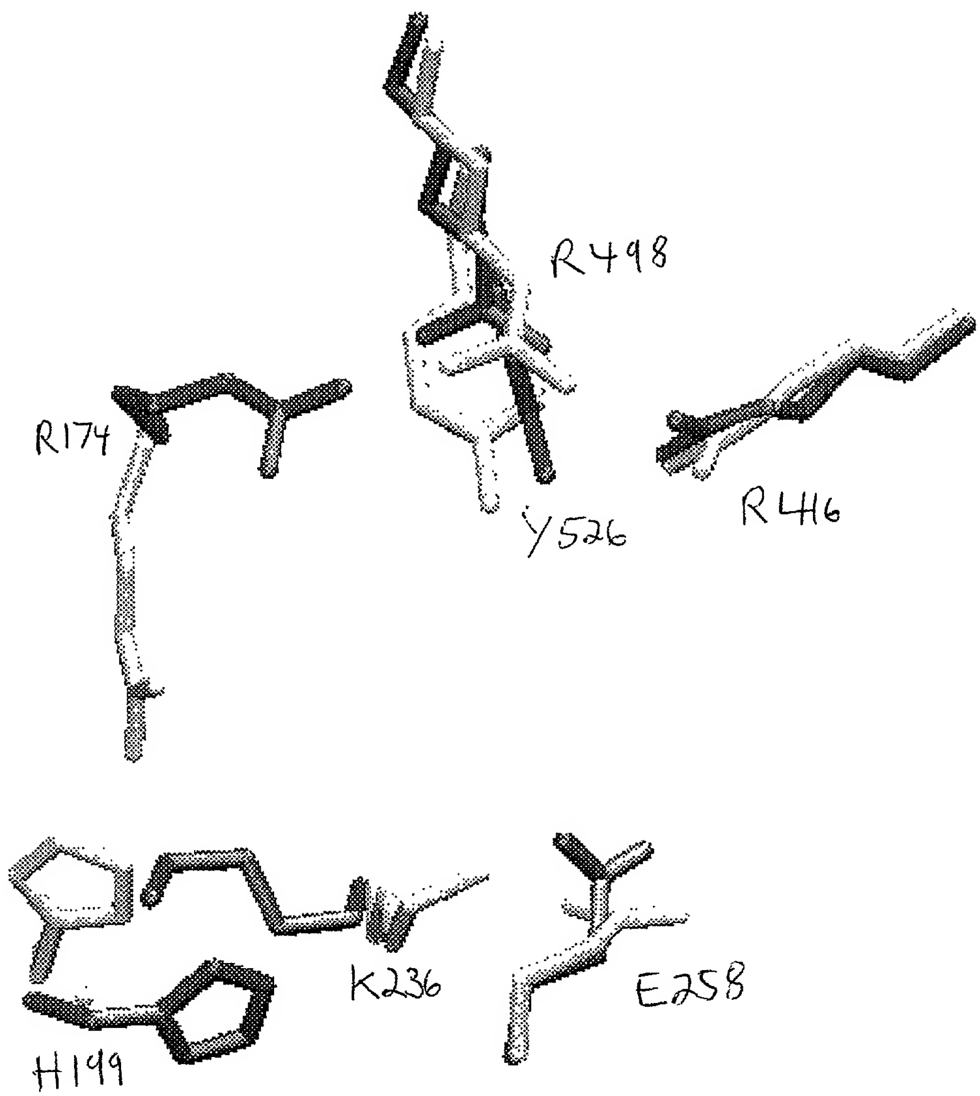

Fig. 4

	Native 1	Native 2	Native 3	Native 4	NANA	DANA
Cell (Å)	73.3	72.3	71.7	72.0	71.6	137.5
	78.0	77.9	77.9	83.8	77.6	137.5
	202.6	199.2	198.2	201.5	197.2	116.6
Temp(K), pH	293, 7	100, 4.6	100, 4.6	293, 6	100K, 4.6	100K,6.5
Resolution (Å)	3.0	2.0	2.5	3.0	2.5	2.8
# obs	172104	623166	420703	277932	210555	498619
# unique	20022	68217	38168	22207	29671	38673
Complete ness(%)	83	86	97	88	76	94
R_{merg} (%)	9.3	4.9	3.1	9.3	4.2	5.2
R-factor			0.222		.223	0.209
R_{free}			0.277		.291	0.235
# protein atoms			6914		6914	6896
# CHO, Ca,			89		116	111

Fig. 5

ligands			
# waters	211	207	239
<B> A, B Å^2	25,36	32,44	44,44
<B> ligand Å^2		38,57	48,41

Table 1 Crystallographic data and refinement statistics.

Datasets Native2, Native3, NANA and DANA from frozen crystals were collected on beamlines X11 and BW7A at DESY, Hamburg. All other datasets were collected on in-house rotating anode and image plate or multiwire detector systems.

$R_{merge} = \Sigma_{hkl} \Sigma_i |\Sigma I^i_{hkl} - \langle I_{hkl} \rangle| / \Sigma_{hkl} \Sigma_i \langle I^i_{hkl} \rangle$ where the sum *i* is over all separate measurements of the unique reflections hkl.

$R\text{-factor} = \Sigma_{hkl} ||F_{obs}| - |F_{calc}|| / \Sigma_{hkl} |F_{obs}|$

R_{free}, as R-factor but summed over a 10% test set of reflections.

Fig. 5 (continued)